

AA

Dr. Debus

MAR 3 / 1972

SUBJECT: Skylab Mission Rules, SLPD #46

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The subject directive has been closely coordinated with KSC during its development cycle and therefore we should have no problem in implementing it.

We will be able to implement this directive at KSC by making very minor revisions to "Apollo Launch Mission Rules" KPD 8020.1A, and reissuing it for Skylab.

The Director of Launch Operations has revised the "Launch Mission Rules Handbook" used for Apollo and plans to issue it as KHB 8630.X(TBD), which will be applicable for the remainder of the Apollo Program as well as for the Skylab Program.

Handwritten signature of Robert C. Hock
Robert C. Hock

NASA/KSC MAR/72



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER
KENNEDY SPACE CENTER, FLORIDA 32899

REPLY TO
ATTN OF: AA-SVO-3(72-1-19)

MAR 8 1972

MEMORANDUM

TO: Distribution

FROM: AA/Manager, Apollo-Skylab Programs

SUBJECT: Skylab Mission Rules, SLPD #46

The subject directive is being distributed for your information; a copy of the briefing note to Dr. Debus is attached.

A handwritten signature in cursive script, reading "Robert C. Hock", is written over the typed name.

Robert C. Hock

Enclosure

Distribution:
STD-L-M

SKYLAB
PROGRAM DIRECTIVE NO. 46

TO : DISTRIBUTION

FROM:

John H. Disher
DIRECTOR, SKYLAB PROGRAM

SUBJECT: SKYLAB MISSION RULES

REFS : (a) Skylab Program Directive No. 43, "Operations Directive"
(b) Skylab Program Directive No. 10A, "Skylab Nonconformance Reporting and Corrective Action"

I. PURPOSE

This directive establishes the requirement for issuing Mission Rules prior to each Skylab mission. The Mission Rules shall be implemented as necessary to ensure crew safety, and to maximize the probability of accomplishing the mission objectives set forth in Skylab Program Directive 43 (reference a).

II. SCOPE AND APPLICABILITY

A. This directive sets forth the general contents and description of the Mission Rules and establishes the responsibilities for preparation, coordination and review of the rules for each mission.

B. This directive applies to the Office of Manned Space Flight and to the Manned Space Flight Installations. It also provides guidance to the Office of Tracking and Data Acquisition, the Goddard Space Flight Center, and the Department of Defense in their capacities as support organizations for manned space flight.

III. RESPONSIBILITIES

A. NASA Headquarters

The Skylab Program Director is responsible for overall Mission Rules policy, including mission policies and requirements set forth in SLPD 43. He or his designated representative will review the final Mission Rules and will concur in all changes thereto. The Director of Skylab Operations will insure that the Mission Rules are properly prepared and implemented, and will coordinate Headquarters rules inputs and reviews.

B. MSF Centers

Each Center will establish procedures governing Mission Rules activities consistent with this directive. KSC is responsible for preparing Launch Mission Rules, and MSC is responsible for preparing Flight Mission Rules.

MSC also provides mission rules inputs to KSC and concurs in the final Launch Mission Rules. MSFC is responsible for providing mission rules inputs to KSC and MSC, and for concurring in the final mission rules of both Centers.

C. Department of Defense (DOD)

The DOD Manager for Manned Space Flight Support Operations (DDMS) is requested to ensure that DOD Operations Orders for Skylab missions are consistent with the Mission Rules. The DDMS and other DOD support organizations are requested to assist in the development and coordination of the Mission Rules as specified in Section V.

IV. MISSION RULES CONTENT

A. General

The Mission Rules will contain preplanned decisions designed to minimize the amount of real-time activity required to cope with non-nominal situations. Mission Rules will be effective during launch countdown, manned and unmanned periods of flight, the Countdown Demonstration Test (CDDT), and other designated periods deemed critical to mission success. They will consist of Launch Mission Rules published by KSC and Flight Mission Rules published by MSC. Both Launch and Flight Mission Rules shall conform to and reflect the mission policies and requirements stated in SLPD 43.

All Category I, IS, and II Single Failure Points (SFPs), as defined in reference b, shall be addressed in the development of the Mission Rules. The Rules will specifically address those potential failures or problems which could:

- (1) Affect decisions to launch.
- (2) Affect decisions to abort or to deorbit early.
- (3) Affect the priorities of experiments and other inflight operations.
- (4) Affect crew safety in any way.
- (5) Affect GO/NO-GO decisions to continue to the next mission phase or activity, such as EVA.
- (6) Involve contingency command action to be taken during periods of unmanned flight.

In addition, the Mission Rules documents shall clearly identify roles and responsibilities for requesting a hold in the launch countdown, for requesting an abort at various stages of the mission, for responding to launch site emergencies, and for processing mission critical data to Program Management.

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B. Launch Mission Rules

The Launch Mission Rules shall address the following:

- (1) On-board instrumentation judged mandatory or highly desirable for collecting data for flight control purposes or post-flight evaluation.
- (2) On-board instrumentation judged mandatory or highly desirable for verifying that the space vehicle is ready for launch.
- (3) Redline values defining upper and/or lower limits of various available parameters, for any system or group of experiments essential to mission success.
- (4) Range instrumentation and other launch support systems judged mandatory or highly desirable for preparation and launch of the space vehicle or for post-flight analysis of the launch.
- (5) Launch window restrictions.
- (6) Weather restrictions.
- (7) Range safety rules and agreements jointly established by KSC and the Air Force Eastern Test Range.
- (8) Launch abort criteria.
- (9) Flight crew and launch complex safety rules.
- (10) Rules relating to human or medical aspects of launch preparation and launch.
- (11) Hold/cutoff guidelines.
- (12) Space vehicle functional sequence.

C. Flight Mission Rules

The Flight Mission Rules shall address the following:

- (1) On-board instrumentation judged mandatory for control of the space vehicle after lift-off.
- (2) Redline values of certain critical system parameters.
- (3) Mission Control Center, Eastern Test Range, and MSFN support requirements mandatory for flight operations.
- (4) Launch window rules pertaining to items such as time of lift-off, launch azimuth, recovery, spacecraft performance limitations, etc.
- (5) Trajectory and guidance rules.
- (6) Flight abort criteria.
- (7) Recovery restrictions.
- (8) Criteria for selection of alternative mission plans.
- (9) Criteria for initiation of the rescue mission.
- (10) Rules pertaining to experiment systems and operations.
- (11) Rules relating to human or medical aspects of manned flight.
- (12) Mission GO/NO-GO criteria based upon systems and medical considerations.

V. PREPARATION AND REVISIONA. General

Each MSF installation will develop procedures for the preparation, revision, and distribution of Mission Rules or Mission Rules inputs, and will distribute copies of the procedures to the Skylab Program Office (Code ML) and to the other MSF field installations. The procedures shall include, but not be limited to, the following:

- (1) Information relative to format and structure of the Launch Mission Rules documents and the Flight Mission Rules documents.
- (2) Designation of a single point-of-contact for policy and commitment in processing Mission Rules correspondence and communications received from the Skylab Program Office (ML) or from other MSF installations.
- (3) Identification and description of responsibilities of working level operational elements active in development and processing Mission Rules.
- (4) Designation of approval authorities within the Center and description of the approval process.

B. Launch Mission Rules

KSC will develop and publish Launch Mission Rules for each mission. Preliminary and final Launch Mission Rules will be published; however, if launch operations remain basically unchanged, the final Rules from the previous mission may serve as the preliminary document for the next mission. A Launch Mission Rules Document (LMRD) for the Skylab Rescue Mission will also be developed, reviewed, and approved in parallel with the SL-2 LMRD. The approved Rescue LMRD will be available for issuance not later than two weeks following the SL-2 launch. Similar action will be taken for subsequent missions.

At KSC's request, MSC and MSFC will provide KSC with coordinated and documented inputs to the Launch Mission Rules. AFETR is also requested to provide necessary inputs in accordance with the KSC need dates.

The final Launch Mission Rules will be approved by the KSC Director of Launch Operations, and will reflect the concurrence of the KSC Apollo-Skylab Program Manager, the MSFC Mission Operations Manager (or his designee) and the MSC Director of Flight Operations. The final Launch Mission Rules will be published not later than 30 days prior to start of the first applicable pre-launch test.

C. Flight Mission Rules

MSC will develop and publish Flight Mission Rules for each Skylab Mission. Preliminary and final Flight Mission Rules will be published; if flight operations remain basically unchanged, the final Rules from

the previous mission may serve as the preliminary document for the next. MSC will also publish Flight Mission Rules for space rescue on Mission SL-1/SL-2; these Rules will be updated for subsequent missions.

MSFC, in accordance with MSC need dates, will furnish documented launch vehicle inputs to MSC and will provide necessary inputs, reviews, and comments to those mission rules that affect the Skylab hardware. DDMS is also requested to provide necessary inputs in accordance with the MSC need dates.

The final Flight Mission Rules will be approved by the MSC Director of Flight Operations with concurrence of the MSC Skylab Program Manager and the MSFC Mission Operations Manager (or his designee). The final Flight Mission Rules will be published not later than 60 days before launch.

D. Coordination and Review

(1) DOD Coordination

a. Copies of the Launch and Flight Mission Rules and changes thereto will be forwarded directly to the DOD Manager for Manned Space Flight Support Operations (Attention: DDMS). Copies of the Launch Mission Rules may be forwarded directly to Air Force Eastern Test Range (AFETR) Directorate of Range Operations (Attention: DOOP).

b. Comments by DOD on the published Mission Rules will be forwarded directly to the Center responsible for their preparation.

(2) Mission Rules Review

a. The Program Director will conduct reviews (with the appropriate centers) of the final Launch and Flight Mission Rules. The Director of Skylab Operations will coordinate the exact time and place for these reviews.

b. General status and specific open items from each review will be included in the corresponding Flight Readiness Review.

E. Revision

(1) Prior to the SL-1 FRR, the Program Director will be kept informed of Mission Rules development through normal coordination and distribution.

(2) After the SL-1 FRR, the following steps will be added to the approval process:

- a. Changes to Mission Rules will require concurrence of the Program Director (or his designee) prior to publication. The only exceptions will be administrative changes that do not affect: flight safety, the accomplishment of mission objectives, deviations from the nominal mission, or pre-launch constraints.
- b. Proposed changes to the Flight Mission Rules will be coordinated with the Program Director (or his designee) after approval by the MSC Flight Operations Director.
- c. MSC and MSFC will transmit all Launch Mission Rules change requests to the KSC Director of Launch Operations and concurrently to the Program Director, or his designee. If the Program Director agrees that further processing is warranted, the Director of Launch Operations will proceed with evaluation and subsequent approval or disapproval. All changes approved by the KSC Launch Director will be coordinated with the Program Director, or his designee.
- d. KSC and MSC points-of-contact will transmit LMR and FMR change requests, respectively, by the most efficient method including telephone if the situation requires. Telephone requirements will be followed by documented concurrences.
- e. The Program Director (or his designee) will officially notify the appropriate center point-of-contact of his concurrence or non-concurrence with each change request.

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